

# Hydrothermal Endometrial Ablation Can Reduce the Need for Hysterectomy and Transfusion

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## ABSTRACT

Women seeking emergency care for severe uterine hemorrhage with profound anemia often undergo transfusion dilatation curettage and ultimately hysterectomy. The purpose of this article is to describe a modern conservative approach to treating persistent uterine hemorrhage unresponsive to medical therapy, avoiding transfusion and allowing for nonemergent future therapy without the potential complications of transfusion. Six patients with unremitting uterine bleeding were included in the study performed in the Department of Gynecology at an academically affiliated general hospital. Patients underwent successful hydrothermal endometrial ablation after failed medical therapy. This procedure is effective in controlling severe uterine bleeding in patients with large intrauterine fibroids; thus, the number of women being transfused can be significantly reduced.

**Key Words:** Hydrothermal endometrial ablation, Fibroids, Myoma, Hemorrhage.

## INTRODUCTION

Of the 600 000 hysterectomies performed each year,<sup>1</sup> over 150 000 patients undergoing the procedure have severe uterine bleeding as a significant diagnosis.<sup>2</sup> Many patients have bleeding to the point of severe anemia and often require emergency transfusion to control anemia and allow orderly elective therapy. Many of these hysterectomies and transfusions can be avoided. In the majority of cases involving severe uterine hemorrhage, we have found large submucosal and intrauterine fibroids.<sup>3</sup> Medical therapy has frequently failed to control hemorrhaging.<sup>4-6</sup> This case report describes a group of 6 post reproductive patients treated from 2003 through 2005 who underwent hydrothermal endometrial ablation to control severe persistent uterine hemorrhage.

In 1997, Milton Goldrath<sup>7</sup> described a technique for hysteroscopic instillation of hot saline solution to treat recurrent uterine bleeding. According to the current hydrothermal technique (HTA Boston Scientific, Natick, MA), saline is placed inside the endometrial cavity, and computer control is used to guard against fluid leakage. The fluid is then heated to 90°C and monitored for 10 minutes under direct hysteroscopic control. Blanching of the endometrium as well as intrauterine or submucosal myomas can be visually followed. Because of the emergent nature of all procedures, no pretreatment is undertaken. A suction curettage is performed for tissue diagnosis and thinning of the endometrium. A #5 suction Vacurette is used to avoid overdilatation.

## CASE REPORTS

### Patient 1

The patient is a 46-year-old, G0, with a history of primary infertility and a myomatous uterus. She underwent myomectomy in 1993. Findings at that time included a 12-week to 14-week size uterus and normal-appearing ovaries. Five intramural myomas were removed at that time. In addition, upon entering the endometrial cavity, we noted and excised a 4-cm myoma of the endometrium. Total leiomyoma weight was 200g. The patient then presented in July 2003 complaining of severe menorrhagia.

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She was noted to have a 24-week size uterus at that time. Hemoglobin/hematocrit (H/H) was 10.1/31.2. Norethindrone acetate 5mg bid was prescribed to control menorrhagia. The endometrial biopsy was benign. In August 2003, the patient's H/H had increased to 12/35. However, she was still experiencing bleeding and agreed to a supracervical hysterectomy but refused any possibility of intraoperative nonautologous transfusion because she is a Jehovah's Witness.

The decision was then made that preoperative autologous blood should be available before definitive surgery. The patient gave written informed consent to undergo hydrothermal endometrial ablation to control bleeding and further increase hemoglobin before hysterectomy. She underwent suction D&C, hysteroscopy, and hydrothermal ablation on August 19, 2003. Pathology showed asynchronous secretory endometrium. A hysteroscopic examination revealed a large 4-cm Type 2 submucosal myoma. Iron therapy was begun, and improvement was noted. The patient was therefore able to donate a unit of autologous blood before definitive surgery. On September 15, 2003, the patient was taken to the OR for a supracervical hysterectomy with posterior cervical myomectomy. Her H/H at that time was 13.3/39.6. Findings included a 26-week size uterus with multiple myomas. The posterior cervix was noted to have a 20-cm × 20-cm myoma. Both ovaries and tubes appeared normal bilaterally. Pathology noted an endometrium with reactive changes consistent with the prior ablation. The uterus was also noted to have cervical, intramural, subserosal, and submucosal leiomyomas with focal hypercellularity and focal infarct. The patient had an uncomplicated postoperative course.

### **Patient 2**

A 43-year-old, P2002, patient presented with a 2-year history of menorrhagia and dysmenorrhea. She was noted to be anemic with a hemoglobin of 7g and hematocrit of 25%. Her local physician had prescribed oral contraceptives, but bleeding was not controlled. An MRI showed a 4-cm submucosal fibroid, and a 5-cm subserosal fibroid. Oral contraceptives were discontinued, and the patient was given GnRH agonist 3.75mg IM, to control bleeding during iron therapy.<sup>6,7</sup> She continued to bleed however after 6 weeks of agonist therapy, and subsequently underwent suction D&C with hysteroscopy and hydrothermal ablation. Intraoperative findings included a large submucous fibroid and an 8-week to 10-week size uterus. Preoperative H/H was 9.6/29.1. The patient did well postoperatively, and bleeding ceased. The endometrial curettings were noted to include fragments of an endometrial polyp

on pathology. The patient returned to the OR on September 20, 2004 for a suction D&C with hysteroscopic resection<sup>8-10</sup> of the submucosal fibroid and laparoscopic myolysis.<sup>11</sup> The Vaportrode (Wolf Surgical, Gyor, Hungary) electrode was used during the hysteroscopic portion of the case to further ablate the endometrium.<sup>12</sup> Preoperative H/H was 12.4/37.2. Estimated blood loss during this operation was 50mL. Intraoperative findings included a 4-cm submucosal fibroid and a 5-cm fundal fibroid. Pathologic evaluation revealed portions of leiomyomata with extensive coagulation necrosis. The patient did well postoperatively with no further complaints. She has been followed for 14 months and has had no further bleeding. The uterus has decreased in size with only a 2.5-cm residual myoma seen on endovaginal ultrasound.

### **Patient 3**

A 49-year-old female presented with menorrhagia and known fibroid uterus. She reported having a myomectomy in 1997 with 15 fibroids removed. An MRI revealed an enlarged leiomyomatous uterus 12.2cm × 8.7cm × 8.5cm. Multiple intramural, subserosal, and submucosal myomas were demonstrated. The largest submucosal myoma included a left posterior body myoma measuring 2.9cm × 2.8cm and a right-sided submucosal myoma measuring 3.3cm × 2.3cm. Distortion of the endometrial canal was noted. The patient received GnRH agonist 3.75mg IM. Norethindrone acetate 5mg bid was added to control bleeding. These interventions were not successful. Hysteroscopy, suction curettage, and hydrothermal ablation were performed on February 23, 2005. Findings at that time included a large submucosal fibroid. Bleeding now stopped; the patient then received a second dose of agonist on March 22, 2005, followed by a hysteroscopic resection and laparoscopic myolysis<sup>13</sup> on April 12, 2005. Findings included a 12-week size fibroid uterus with multiple submucosal fibroids. The patient's preoperative hemoglobin was increased from 10.3/31.9 on December 12, 2004 to 14.3/44.8. On POD #1, the patient was noted to have an H/H of 12.7/39.9. She did well postoperatively with no further complaints at her follow-up visit.

### **Patient 4**

The patient is a 45-year-old female who presented in May 2004 complaining of 3 months of menorrhagia. The patient underwent a D&C for menorrhagia in March 2004 that was performed by her local physician, but without relief. A sonogram obtained on POD#6 showed a uterus measuring 11.7cm × 6.9cm × 10.1cm with two 5-cm subserosal fibroids and one 4-cm intramural fibroid. The

patient was started on norethindrone acetate 5mg bid. The patient received GnRH agonist 3.75mg IM on May 25 and June 22, 2004. The menorrhagia persisted in the face of medical interventions. The patient then underwent hydrothermal ablation on July 12, 2004. She subsequently underwent hysteroscopic resection of submucosal fibroids<sup>14</sup> with laparoscopic myolysis.<sup>15</sup> The patient did well post-operatively with no further complaints.

### Patient 5

This patient is a 45-year-old, G2P2, with a 1-year history of increasing uterine bleeding. Her last menstrual period began in May 2005 and continued until the middle of August. Norethindrone acetate 5mg bid slowed the bleeding. Hysteroscopic examination revealed an intrauterine mass filling the entire cavity of the uterus.<sup>9,13</sup> Ultrasound revealed a 6-cm fibroid mostly intrauterine and an additional 6-cm to 7-cm subserosal mass. The patient's hematocrit was 24%. She refused transfusion and hysterectomy. Hydrothermal ablation was performed with fluid (normal saline was heated to 90°C for 10 minutes). The patient stopped bleeding and is being treated with iron supplements to restore her hemoglobin level.

### Patient 6

The patient is a 44-year-old, G3P3, with a 6-month history of increasing vaginal bleeding. She was treated by her local medical doctor with progesterone and subsequent dilatation and curettage. Findings included fibroid uterus and proliferative endometrium. Because of increasing bleeding, the patient sought emergent treatment at her local hospital. Her hemoglobin was found to be 6g. She was treated with 2 units of packed red blood cells. She contacted our office and was subsequently started on norethindrone acetate 5mg bid; however, she continued bleeding and underwent hysteroscopy, dilatation and curettage, and hydrothermal ablation. The findings included a 5-cm submucosal myoma. The bleeding stopped, and the patient is being treated with hematinics.

## DISCUSSION

In this article, we describe 6 post reproductive patients with severe uterine bleeding and resultant severe anemia who were unresponsive to GnRH analog therapy and norethindrone acetate therapy. Each of the patients had significant >4-cm intrauterine myomas. It was judged that attempting hysteroscopic resection or abdominal surgery without transfusion would be putting the patient at considerable risk. Hydrothermal ablation was successful in all

6 patients. In the first patients, the fibroids were well over 1 kilogram, and myomectomy or myolysis was not appropriate. Conservative therapy was appropriate in the other patients. Hydrothermal ablation should be considered the first-choice treatment for patients with persistent uterine bleeding, resistant to medical therapy because it significantly reduces the need for transfusion. Glasser<sup>15</sup> showed that hydrothermal ablation could be effective in the treatment of submucosal myomas of up to 4cm. In our patients, all myomas were >4cm. With the use of hydrothermal ablation, transfusion in these patients was unnecessary.

The treatment of persistent severe menorrhagia has most often included transfusion and hysterectomy. Our approach is to identify the cause of bleeding and bring it under control with medical therapy until hemoglobin improvement allows us to perform desired conservative therapy. We report here on 6 patients who did not respond to medical therapy but did respond to hydrothermal ablation. Please note that subsequent myolysis and resection of the fibroids were carried out because of previous findings.<sup>16,17</sup> The combination of myolysis, endometrial ablation, with or without resection, reduced the subsequent hysterectomy rates from 35% to 5.7% in that study. Failure to treat both the external portion of the fibroid and the internal submucosal portion resulted in a high recurrence rate of symptoms and subsequent hysterectomy.

## CONCLUSION

Severe anemia secondary to uterine fibroids often requires blood transfusion followed by hysterectomy. Hydrothermal ablation can obviate the necessity for transfusion and play an important role in the treatment of persistent uterine bleeding secondary to large submucosal and intrauterine myomas that are resistant to medical therapy. This report demonstrates the feasibility of hydrothermal ablation to avoid the need for hysterectomy as an emergency procedure and to reduce the need for transfusion, thus significantly reducing the number of women being transfused. This new approach, to our knowledge, has not been previously reported in the literature.

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